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ABSTRACT

An apparatus for reducing noxious gases in the exhaust emissions of an automobile is disclosed. During engine cold start, a cold start injector having a heater downstream of the injector outlet vaporizes fuel so that a leaner air-fuel mixture can be used, thereby reducing engine emissions before the engine and catalytic converter warm up. The heater includes various configurations for swirling the fuel and exposing it to large surface areas for improving the vaporization of the fuel. A tapered bore surrounding the throttle allows for precise air flow control into the cold start device during engine warm-up.

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